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## Consumers' experiences with premature obsolescence – Insights from seven EU countries

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**Keywords:** durability; product replacement; premature obsolescence; circular economy; consumer feedback.

**Abstract:** Premature obsolescence of electrical and electronic equipment is often considered one of the major factors driving the waste generation from this product category. Being the result of a mix of many technical and non-technical elements, this phenomenon is as complex as it is important. However, in order to increase products' useful lifetime, better insight into the mechanisms of premature obsolescence is indispensable.

The EU-funded project PROMPT (Premature Obsolescence Multi-stakeholder Product Testing Program) aims to reduce the information asymmetries between producers and consumers by making premature obsolescence measurable. As part of its activities, consumer organisations in seven European countries (Belgium, France, Germany, Italy, Portugal, Spain and The Netherlands) started collecting comparable data on consumers' experiences with failed products. A continuously available online platform was launched in five of these countries, allowing consumers to report products of which they expected longer use. In Germany and The Netherlands, comparable data was collected using an online survey.

This paper has the main objective to present and discuss the preliminary results from the analysis of the data collected in the different countries. The results show direct consumer feedback on the products that are failing most often and their respective failure modes, as well as consumers' experiences with and attitudes towards repair.

### Introduction

The manufacturing of electrical and electronic equipment (EEE) requires a significant amount of resources. Once these devices reach the end of their useful life, the generated waste can have negative impacts on the environment. For this reason, extending the useful lifetime of the devices can help to reduce the strain on both resource extraction and waste generation. Product obsolescence is a multi-faceted topic and can be related to different absolute (e.g. material wear, technical causes, etc.) and relative (e.g. psychological, technological, economic) drivers (Cooper, 2004). Recent research shows that many products are disposed of before they have reached the end of their functional life (van den Berge et. al, 2020). To increase products' useful lifetime, better insights into the mechanisms of premature obsolescence are indispensable. One important source of information to better understand the drivers behind product replacement can be the direct feedback provided by consumers.

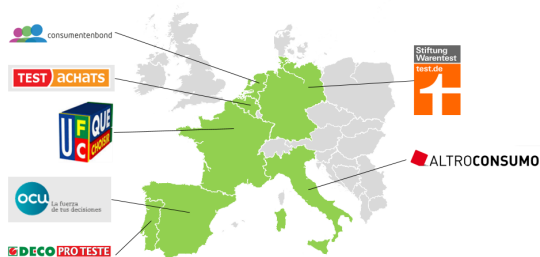
### Methodology

In 2016, the Belgian consumer organisation Test-Achats launched an online web tool enabling consumers to report products that failed prematurely. The main goal was to gain further insights into the phenomenon of premature obsolescence. With the help of extensive press coverage, over 3.000 consumers reported their broken products within the first month after the initial launch. This number grew to 8.400 by 2019.

Despite the limitation of being fully representative, this bottom-up approach allowed the consumer organisation to collect different kinds of information through a short questionnaire. Data points included e.g. the age of the broken product, the nature of the defect, the consumers' choice to opt for a repair or not and the underlying motivation as well as the outcome of the repair attempt. Selectable product categories, brands and models were based on GfK Etilize market data.

Respondents also had the option to leave additional comments.

In the context of the H2020 PROMPT project, consumer organisations in France (UFC-Que Choisir), Italy (Altroconsumo), Portugal (Deco Proteste) and Spain (OCU) followed this approach and launched their versions of this web tool in 2019. Consumer organisations in Germany (Stiftung Warentest) and The Netherlands (Consumentenbond) opted for a survey approach in the same year, using an extended version of the tool's questionnaire.



**Figure 1. Overview of countries and organisations collecting consumer feedback.**

While the web tools rely on recurring online communication campaigns to incentivise consumers to visit the website and report their broken products, the surveys were based on one-time e-mail invitations.

In Germany, invitations to the survey were sent to 316.858 Stiftung Warentest subscribers. Additionally, posts were made on the consumer organisation's website, magazine and social media pages. Due to the choice of the organisation's communication channels, the sample is not fully representative of the German population. However, it still provides valuable insights on consumer experiences with product breakdowns. The survey closed after one month.

In the Netherlands, the invitation to the survey was included with a monthly newsletter, which was sent to 256.000 of the consumer organisation's paying subscribers and 426.000 non-paying subscribers. It was furthermore shared through Consumentenbond's social media channels. The survey is still open at the time of writing.

## Results

The overall data collection process in the context of the H2020 PROMPT project is ongoing until 2023. For this reason, this paper only presents preliminary results and focuses on four product categories: smartphones, televisions, washing machines and vacuum cleaners. Table 1 shows the number of

completed questionnaires per country as of October 2020.

**Table 1. Number of records collected per country on 1/10/2020.**

Country	Type	Records
Belgium	Web tool	9.411
France	Web tool	3.493
Germany	Survey	4.774
Italy	Web tool	645
Portugal	Web tool	95
Spain	Web tool	534
The Netherlands	Survey	875

## Most reported product types

The pro-active character of the web tools requires consumers to be intrinsically motivated to take the effort and report their products that failed prematurely. This motivation seems to be higher for products that are more relevant to consumers, represent a higher purchase value and of which they expect to have a longer lifespan. Everyday products, such as smartphones, are amongst the most often reported products. Wall-mounted boilers and systems for central heating are amongst the most often reported products outside of the selectable product categories in the web tools. On the other hand, small household appliances (e.g. hairdryers, hand mixers and toasters) are reported much less often. The following table summarizes the most reported products per country as of October 2020.

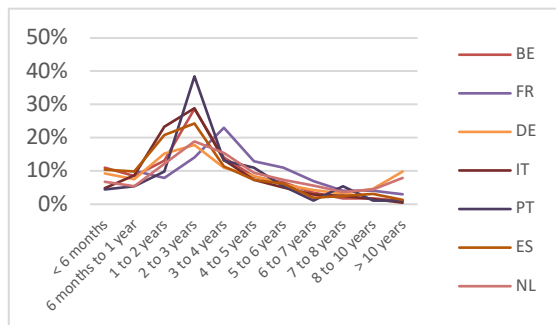
**Table 2. Five most reported products per country on 1/10/2020.**

	BE	FR	DE	IT	PT	ES	NL
Mobile phones							
Printers							
Washing machines							
Dishwashers							
Televisions							
Coffee machines							
Fridges & freezers							
Laptops							
Vacuum cleaners							
Tumble dryers							
Tablets							

Despite the different methodologies, similar trends can be observed in the different countries.

### Age at first defect

Figure 2 shows the reported age of the products at the time of their first failure in the seven countries. The Figure shows the average age and includes all product categories.



**Figure 2. Product age at first defect, across all product categories**

It can be observed that the share of reported products is relatively low in the first year and increases afterwards. A spike can be observed at around 2-3 years in all countries. While no direct correlation can be established, this time coincides with the end of the usual legal guarantee period (Official Journal, 1999).

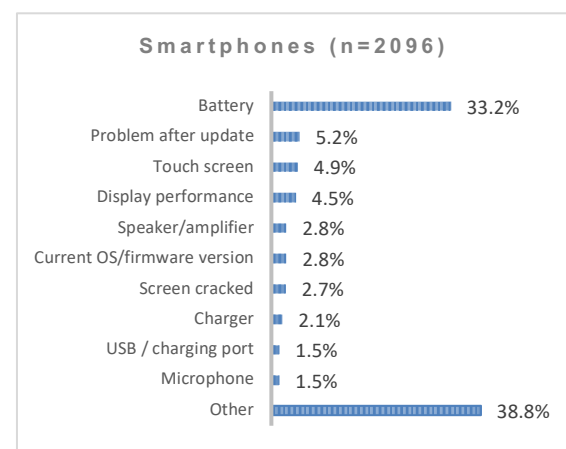
However, it is important to note that there are clear differences between the product categories. As an example, less than 15% of the reported mobile phones were over four years old when they failed for the first time. On the contrary, the reported washing machines were more evenly distributed over time. Further differences between countries can be explained by the different shares of reported product categories and the time of the first defect.

In Italy for example, half of the reported products were mobile phones, which resulted in a lower overall age at first defect than in The Netherlands, where coffee machines and washing machines were reported the most. The results do not show the age at which most products broke down, but rather at which age the consumers considered a defect being 'too early'.

### Reported defects

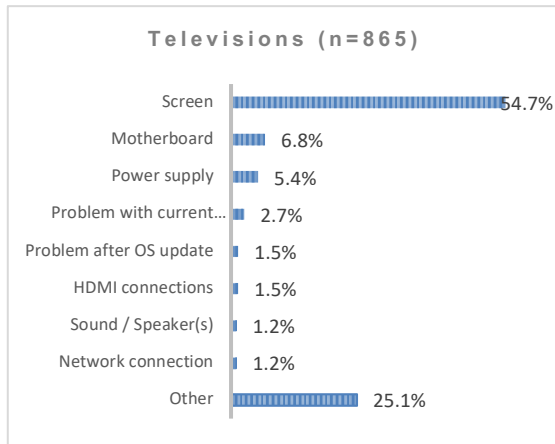
Within the reported defects for **smartphones**, only batteries could be discerned as a clear trend, since more than 1/3 of reported smartphones had battery issues. For most other defects, the proportions differ significantly

between the different countries. Besides **batteries**, **software issues** and **display performance problems** are the most commonly reported defects. Software issues cover a wide variety of complaints and do not necessarily put the device in a limiting state (e.g. the lack of updates) or reduced performance after an update, but play an important role in the perceived residual value and the premature replacement of these devices. The below Figure summarizes the findings.



**Figure 3. Aggregated overview of smartphone defects, reported in Belgium, France, Italy, Portugal and Spain**

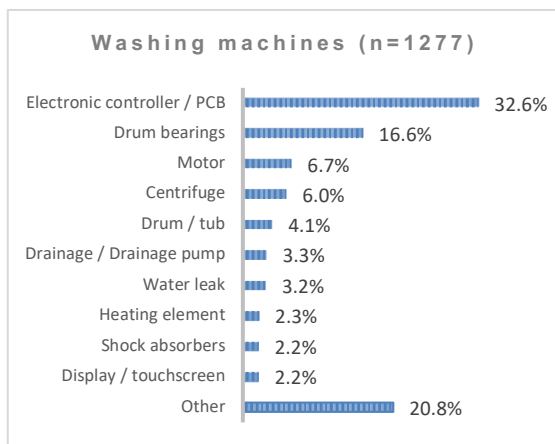
**Televisions** are among the high-tech products which are composed of only a few (larger) and often integrated parts. These parts are relatively expensive compared to the price of the entire device which can and be a barrier for repair. Up to 61% of the reported TVs had a **failed screen**. Together with the **mainboard** and **power supply**, these three parts account for over 2/3 of TV breakdowns (Figure 4). Software-related issues were rarely reported in Belgium and France but constitute up 13-20% of the reported issues in Germany, Italy, Spain and The Netherlands.



**Figure 4. Aggregated overview of television defects, reported in Belgium, France, Italy, Portugal and Spain**

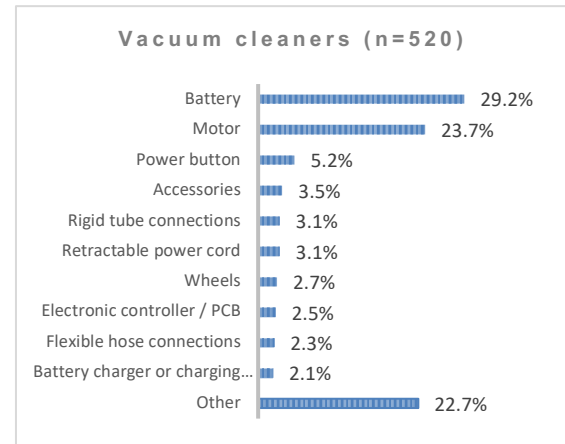
25%-50% of consumers who reported a broken **washing machine** mentioned an issue with the **electronic controller** or the **drum bearings** (Figure 5). Each of these parts is usually relatively expensive to replace, constituting a barrier to repair.

As high-tech features, such as Wi-Fi connectivity, find their way into household products (Internet of Things), the list of reported defects is also changing.



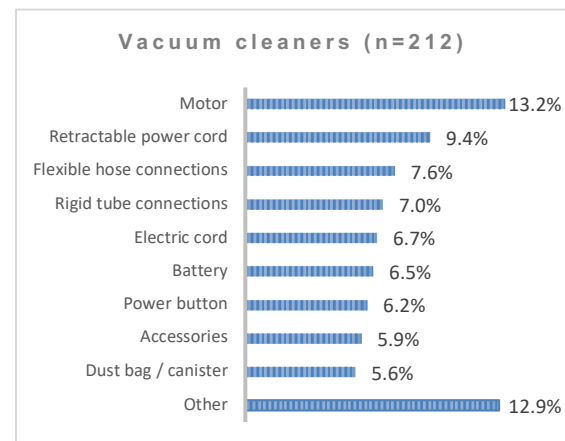
**Figure 5. Aggregated overview of washing machine defects, reported in Belgium, France, Italy, Portugal and Spain**

New types of **vacuum cleaners**, such as robot vacuum cleaners and battery-powered models are gaining in popularity. This can already be observed in the reported defects in Belgium, France and Spain. In these countries, the **battery** and **motor** were responsible for the breakdown of over half of the reported vacuum cleaners (Figure 6).



**Figure 6. Aggregated overview of vacuum cleaner defects, reported in Belgium, France, Italy, Portugal and Spain**

German and Dutch consumers reported, however, relatively fewer issues related to connectivity and batteries, and more problems related to conventional canister vacuum cleaners (Figure 7).



**Figure 7. Aggregated overview of vacuum cleaner defects, reported in Germany**

### Repair

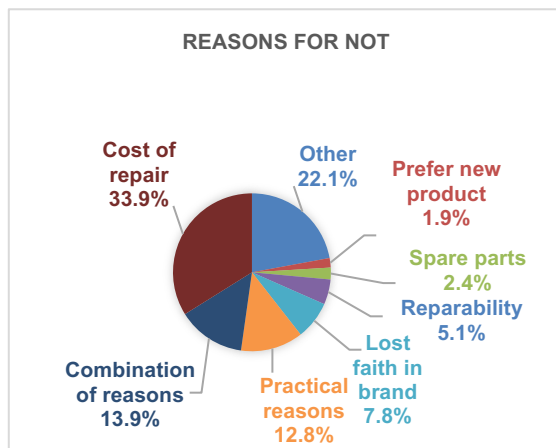
**No repair attempt was made for about 1/3 of all reported products**, whether the products were still covered by a legal warranty or not. In general, **consumers are more likely to attempt to repair large household appliances than small household appliances or consumer electronics**.

National differences can also be found when it comes to the contact point consumers turn to with their broken product. In Belgium, it can be observed that more consumers return their broken product to the seller. In other countries, returns are more evenly distributed between sellers, independent repairers and

manufacturers. In Spain, current data suggests that consumers turn more often towards the manufacturer in case of a defect. The self-repair option was more often observed in Belgium, France, Germany and the Netherlands than in the southern countries. However, this could be explained by the higher proportion of large white goods that have been reported in these countries, since these are typically more often self-repaired than small white goods and consumer electronics.

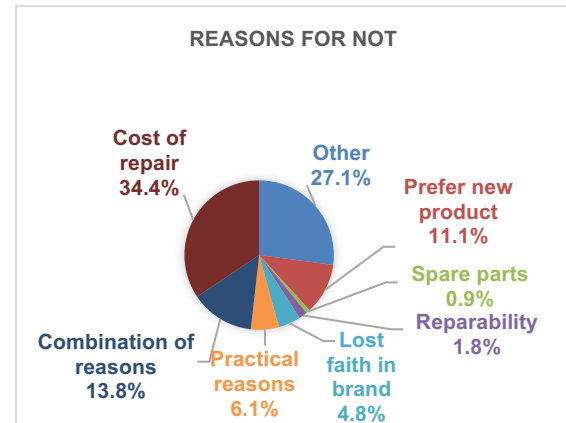
### *Reasons for not repairing*

Consumers in all countries pointed towards the cost of repair as the most important reason for not attempting to repair their broken product. Other important reasons are related to the cost of repair relative to the perceived residual value of the product ('at this price I would prefer a newer product'; 'I lost faith in this brand'). Practical reasons, such as the availability of spare parts or even the reparability of the product ('repair impossible without breaking it') are rarely mentioned as the main reason for not attempting to repair. A possible explanation could be that one would not be aware of any of these practical problems without having attempted to repair the product.



**Figure 8. Reasons for not attempting to repair, reported by Belgian, French, Italian, Portuguese and Spanish consumers via the web tools.**

Figures 8 and 9 show, respectively, the intermediate results of the web tool and the German survey for the reasons why consumers did not attempt to repair their broken product. Similar trends can be discerned for both methodologies, though the preference to replace a defective product with a new one is much more visible in the results of the German survey.



**Figure 9. Reasons for not attempting to repair, reported by German consumers in a survey**

Despite these differences, **the success rate of the attempted repairs is overall around 20%.** This rate varies depending on the product. E.g., up to 1/3 washing machines are repaired successfully and as few as 1/8 of the televisions.

The choice of the repair method appears to have an impact on the outcome of the repair attempt as well. Except for Belgium, consumers who self-repair are more likely to succeed when compared to the other methods. Except for France, consumers who turn directly to the manufacturer are more likely to succeed with the repair than those who return the product to the point of sales. This result is the same for products that broke down within two years after purchase, which is remarkable since it falls within the legal guarantee.

### **Conclusions**

Even though data collection is still ongoing and only preliminary results are available, several shared trends could already be observed between the different countries concerning the most common defects and reasons for not repairing.

For smartphones, the most reported failures were related to batteries, software and the display. For televisions, the screen, mainboard and power supply were responsible for more than 2/3 of reported breakdowns. When it comes to defects in washing machines, the electronic controller and the drum bearings were reported most often. Cordless and robot vacuum cleaners are gaining in popularity, but the battery seems to create problems relatively early in the product's lifetime, next to the motor. In all countries, repair attempts are relatively low, even during the products' warranty period.



Preconceptions or foreknowledge about the price of repair is amongst the principal factors that are hampering repair. Moreover, the lack of knowledge about what the options are for having a product repaired plays a role.

Products not being repaired just because consumers want a new product are rarely reported, even for high-tech products. The choice of replacement over repair is often driven by the financial comparison of repairing versus buying a new product.

It can be supposed that the pro-active nature of the web tools (consumers have to actively go on the website and report their problem) comes with a selection bias since more consumers that have an issue with their products will report their problems. Furthermore, consumers with negative experiences may be more likely to take the effort to report their products. Even though similar trends as with the web tool can be observed in the survey results, the success rate reported in the survey is higher.

As more products are reported throughout the PROMPT project, the data availability will improve and specific trends should become more evident. In addition, more contextual information e.g. about national differences in the structure of the repair sector, product prices and user and market aspects will be used to analyse observed phenomena.

Data collection will continue until the end of the PROMPT project in 2023, and most consumer organisations plan to continue collecting data also afterwards.

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